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ABSTRACT

Economic liberalization and the rise of global competition have increased the importance of agricultural, technical, and business skills for small farmers in Brazil. However, many rural farmers are unable to attend agricultural technical schools due to low educational attainment. The first section of this paper discusses the impact that liberalization of the Brazilian economy has had on small rural producers in the state of Sao Paulo, Brazil. Section 2 examines institutional challenges inherent in the Brazilian rural education system that contribute to the marginalization of rural populations. These include rural-urban differences in enrollment and dropout rates, the effects of child labor, and the lack of practical relevance of school-based agricultural education. Section 3 describes the Programa de Formacao de Jovens Empresarios Rurais (PROJOVEM), developed by the University of Sao Paulo in collaboration with the Paulo Souza Center for Educational Technology and the state government. PROJOVEM is a 3-year alternative program to prepare rural adolescents to administer and manage small farms competitively and sustainably. Using the "pedagogy of alternancia," the program provides 1 week of training per month in a group setting. Learning is focused on student projects on their own farms. A final section discusses the potential of programs such as PROJOVEM for rural adolescents and rural development. An appendix explains the principles of the pedagogy of alternancia, a constructivist, hands-on approach developed in rural France by Abade Granereau. (Contain 25 references.) (SV)

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Economic openness and the marginalization of small family farmers: Aligning curriculum to meet the needs of rural adolescents in Brazil.

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Economic openness and the marginalization of small family farmers: Aligning curriculum to meet the needs of rural adolescents in Brazil.

While the deficiencies of the Brazilian rural education system have contributed to a more unequal relative distribution of income, liberalization of the economy has increased the importance of valuing knowledge and practical skills, particularly among small farmers. These skills are critical components that enable small farmers to decode and adopt new production technology and obtain off-farm employment, which contributes to the reduction of relative income disparities and makes them more competitive in domestic and international markets. This paper will discuss the impact that liberalization of the Brazilian economy has had on small rural producers in the state of Sao Paulo, Brazil (particularly in terms of relative income distribution). It will then examine a University of Sao Paulo partnership project, PROJOVEM, which aligns the educational curriculum to the needs of rural adolescents. PROJOVEM specifically addresses the issues brought on by economic openness and provides rural adolescents with the skills necessary to improve their life chances and reduce relative income disparities.

The world has become increasingly dependant on international trade during the post World War II era. Breakthroughs in the transportation sector have reduced the costs of moving products across national boundaries; improvements in communication systems have expanded the scope of markets; and the computer revolution has facilitated the processing of large amounts of data, making global trading and commerce a reality. As a result, the volume of international trade during the last two decades has grown faster than global GDP. The world has also seen the demise of the Bretton Woods system of fixed exchange rates, which gave way to a system of bloc-floating exchange rate systems; the emergence of a well-integrated capital market; and the shift of the United States from being the world's largest exporter of capital to being the world's largest debtor nation. (Schuh, 1991)

Brazil has been one of the fastest growing economies in the post-war period as rapid industrialization increased its power in the global economy. With an average annual rate of industrial growth of approximately 9 percent a year from 1952-1973, Brazil still remains one of the main players in the international economy with agriculture remaining an important component of the Brazilian economy. In fact, the agricultural sector is responsible for producing more than 70 percent of Brazil's food supply; provides the economic base for approximately 90 percent of municipalities; accounts for 35 percent of Brazil's GDP and maintains 40 percent of the population economically active (Rosa, 1999).

Brazil's development picture has, however, become increasingly complicated by economic liberalization and rise of competition worldwide. Urban and rural firms today require new workers who have the ability to make decisions with imperfect information, monitor their own work, and act entrepreneurially. To further reduce the pressure on firms in urban areas, countries like Brazil are looking for ways to keep rural populations in the agricultural sector and improve the efficiency of small production farms. Interestingly, research conducted by the Paulo Souza Center for Educational Technology (CEETEPS) has shown that some rural farmers have a "calling" or vocation toward agriculture or farm management; however, they are unable to attend the agricultural technical schools because of their low educational attainment levels. As a result, these workers are confined to the same space in society that their parents occupied – that of low salary and hence, a low standard of living.

This paper is divided into four main sections. Section I will provide a brief overview of economic openness in Brazil and the effects this process has had on the agricultural sector. Section II will discuss several institutional challenges inherent in the Brazilian rural education system that

contribute to the marginalization of rural populations. Section III will discuss a rural farm manager's training program (PROJOVEM) that is providing adolescents in the state of Sao Paulo, Brazil with specific skills to help them reduce relative income disparities and improve their future. Finally section IV will conclude by discussing the future potential of programs such as Projovem for rural adolescents.

I. Open Economies and Family Farming in Brazil: Trends and Changes

Liberalization of the Brazilian economy has had many effects on the agricultural sector. It has led rural and urban firms to downsize, making it more difficult for urban sectors to absorb the growing rural migrant population, who tend to leave agriculture when prices and hence income decrease. It has affected prices in the economy, which in turn affects the transfer of resources from agricultural to nonagricultural sectors (since the agricultural sector typically has a low-income elasticity of demand in the aggregate and the price elasticity of demand is less than one, when output increases faster than demand, the prices of agricultural products and incomes tends to fall) (Patrick, 1977). It has led to agrarian reform in the 1990s that reduced discriminatory practices against the agricultural sector (i.e. minimum prices, input subsidies, credit preferences to large farmers) and redistributed land to thousands of small family farmers throughout Brazil. In fact, the advantage in the agricultural sector appears to be shifting towards family farming.

Small family farms do not face economies of scale, which often places increased pressure on larger farms to be more efficient (Guanziroli, 1999). The incomes of small farmers typically consists of a return to capital and management, earnings from labor, and usually non-monetary income such as housing, homegrown food and unrealized appreciation of property values (Patrick, 1977). Family members partake in the profits, which increases their incentive to farm the land. They also tend to use land and labor more intensively, and since they do not hire outside laborers, their costs of production tend to be significantly less when compared to large production farming operations. Agricultural incomes also tend to have a relatively larger transitory component as well. Household members supplement household income with off-farm sources and this is particularly true with small family farmers (Patrick, 1977). In fact, Brazil has witnessed the rise of part-time farmers who both farm the land and work in the non-farm sector to supplement family income (Guanzirolli, 1999).

Small family farms in Brazil currently constitute 28 percent of total agricultural production despite having only 22 percent of the land and receiving only 11 percent of the available credit (Guanzirolli, 1999). Despite these accomplishments, economic liberalization has placed financial pressure on agricultural families as inefficient farms are squeezed out of the market. Since families do not see returns to their children's education (due to the low quality of rural public education), they encourage their children to leave school and enter the labor market (either rural or urban) to earn money for family sustenance. However, as a result of the children's low educational attainment, they often enter into the non-formal labor market and work for extremely low wages. The result in Brazil is that the income disparities between the agricultural and the nonagricultural sectors have continued to increase, and the rural populations have continued to be marginalized as economic liberalization has progressed.

As these economic forces have placed pressure on agriculture to become more efficient, education has become a key component to improving economic competitiveness, raising incomes, improving health, and achieving sustained growth. It is undeniable that education can assist in shaping human resources that are the foundation for creating a skilled work force that can adopt new technology, and assist in making industries more competitive in the world market.
The international literature in agriculture, economics and rural sociology supports the idea that the provision of a general education enhances farm productivity (Psacharapoulos, 1987). Lockheed, Jamison and Lau (1982) found that all things being equal, acquiring four years of additional education led to a 7 percent increase in agricultural productivity. Harma (1979) elaborates on the mechanisms that link agricultural productivity and basic learning. He argues that when only rudimentary forms of farming were used, increasing basic literacy and numeracy were enough (as would be provided by four years of basic education). However, as agricultural technology becomes more sophisticated and the global community more competitive, farmers will need more than these basic literacy and numeracy skill to cope with the changes.

Taking another perspective on returns to education, a study conducted by Gisser in 1965 (as cited in Manhani, 2000) examined the effects of education on rural-urban migration in the United States. He concluded that education produced two differing effects in the rural regions: that of increasing mobility and that of capacity building. The first effect deals with the fact that education can expand employment options for rural youth by preparing them to leave the agricultural sector. The second effect, that of capacity building, can be seen in the increased ability of youth to execute everyday tasks through the adoption of new technologies and better knowledge of how to allocate

resources. The author concluded that (1) the effect produced by migration supercedes the increases in productivity brought on by the capacity-building effect; (2) a 10 percent increase in the schooling level of rural youth was associated with a 6-7 percent increase in migration patterns and an approximate 5 percent increase in rural salaries[1].

Following Gisser's methodology, Campos (1998) examined the implication of educational investments in the state of Parana, Brazil from 1970-1980. Campos (1998) also found a positive relationship between schooling and rural salaries on the supply side indicating that higher educational attainment corresponded with higher salaries in the rural areas of Parana. On the demand side, Campos found that rural entrepreneurs were indifferent to hiring workers with differing levels of schooling attainment. This seems to support the idea that the capacity building effect is less than the migration/mobility effect.

Welch (1970) examined the effects of education from third perspective. In his article, *Education in Production*, he argues that increased levels of education may permit a worker to simply accomplish more with the resources at hand. This *worker effect* is the marginal product or the increased output per unit change in education holding other factor quantities constant. He also discusses a second effect called the *allocative effect* of education. The *allocative effect* states that increased education enhances a workers ability to acquire and decode information about costs and productive characteristics of other inputs. Welch believed that "If educated persons were more adept at critically evaluating new and reportedly improved input varieties, if they could distinguish more quickly between the systematic and random elements of productivity response, then in a dynamical context, educated persons would be more productive."

Using Welch's model, Ilha and Lima's 1989 study (as cited in Manhani, 2000) analyzed the effects of formal education on production and productivity of two different rural regions in the state of Minas Gerais, Brazil. They were able to disaggregate the worker and allocative effects and concluded that education positively contributed to agricultural production. However, the allocative and worker effects were more prominent in the modern areas. In fact, the allocative effect was almost missing in the rural, less developed areas. This seems to contribute to the belief that the education the poor are receiving again, does not meet their needs in an adequate manner.

In fact, as the Brazilian economy has reconfigured to meet the competitive demands of liberalization, the public education system has not able to respond quickly enough to the demand for

[1] The higher salary results from the removal of access labor from the rural region to the urban sector. The arrival of new labor into the urban area pushes salaries down due to an increase in supply while the removal of labor from the rural area increases salaries by making qualified labor scarce.

new skills – particularly in rural regions. Children in the rural areas continue to receive the same education and curriculum that children in the urban areas receive. The Brazilian rural public education system is oriented towards preparing students to leave the agricultural sector and enter the urban setting. Many rural schools lack even the basic resources such as materials, running water, and multiple classrooms. Instructors rotate in and out of the rural setting and the curriculum is designed towards the urban setting and entering higher education. Rarely does rural education go beyond the fourth grade (although some municipalities have expanded to eighth grade in recent years) so students who wish to continue their education must attend school in urban areas. In light of the lower quality of education received by these students and the discrimination they face when they enter the urban schools, most opt to enter the workforce to help sustain their families.

II. Brazilian Public Education: Issues and Challenges

Despite numerous changes to the public education system (e.g. professionalization of the teaching profession; and fiscal responsibility delegated to states and municipalities) enacted by the 1988 Constitution, Brazil has still failed to match the progress of other developing nations. While enrollment rates have been improving throughout the 1980s and 1990s, Table 1 indicates that there continue to be significant differences between urban and rural schooling due primarily to political, economic, and social conditions that are discussed in various parts of this paper.

Table 1: School Enrollment Rates by Age, and Urban/Rural, (percent)

	1981		1983		1986	
Age	Urrban	Rural	Urban	Rural	Urban	Rural
5	21	7	34	12	42	18
6	39	16	37	28	64	36
7	66	39	77	52	84	62
8	84	59	89	68	91	74
9	88	65	91	74	93	78
10	91	71	93	77	94	79
11	90	71	92	75	92	79
12	88	65	90	70	89	72
13	84	58	85	61	84	62
14	78	47	77	50	77	52
15	70	37	70	39	69	42
16	63	29	61	30	60	30
17	54	23	53	22	53	22
Tota	70	45	74	51	76	55

Source: Perfil Estalistico de Crianças e Mães no Brasil, *1981, 1983, 1986.*

The difference appears to be the starkest at ages five and six where urban enrollment in 1986 was 42 percent and 64 percent compared to 18 percent and 36 percent in rural areas. Furthermore, urban enrollment rates have been improving more rapidly at the younger ages than rural rates. It is interesting to note that while enrollment rates in the primary cycle increased significantly (sometimes by as much as 12-15 percentage points in rural areas), the public education system has not been successful in significantly increasing enrollment rates in grades seven through eleven (ages 12 to 17). These rates have actually remained the same or slightly decreased in urban areas from 1981 to 1986 for ages 12 to 17, and they have increased by only one or two percentage points in rural areas (see Table 2). Enrollment and completion rates are much higher among the private schools, again with marked differences according to region (Birdsall et al., 1996). It is important to

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note that these numbers have improved in recent years, however, stark differences still exist between urban and rural areas

In theory, education is compulsory and free for all children aged 7-14. In the richer Southern states, at least 95 percent of children are enrolled in the first grade; however, in the Northern states, particularly in the rural Northeast, enrollment rates drop to 65-80 percent depending on the geographic location. The reasons for these high dropout rates are complex and may involve such factors as the poor quality of education, economic need, and lack of secondary education in rural areas. In 1996, 14.6 percent of children aged seven or more were illiterate, while 13.8 percent of children aged 10 or more were the same. Rural areas had much higher numbers of illiterate children and adults at all levels when compared with urban areas: 31 percent and 10.5 percent respectively for ages seven or more (see Table 2). There are also marked regional differences. In the Northeast, 29.2 percent of urban children aged 7 or more were illiterate and this number rose to 45 percent for rural areas in that region (see Table 2). In the wealthier South, only 8.1 percent of urban children ages seven or more were illiterate while 17.9 percent of rural children in the South were illiterate.

Table 2: Illiteracy, by Regions, Age and Urban/Rural, 1996 (percent)

Age and Location of Household	Brazil	Urban North	Northeast	Southeast	South	Center West
7 years of age or more	**14.6**	**12.1**	**29.2**	**8.1**	**8.0**	**10.7**
Urban	10.5	12.1	20.5	6.9	6.9	8.9
Rural	31.0	---	45.0	17.9	11.9	18.8
10 years of age or more	**13.8**	**10.6**	**27.3**	**7.9**	**7.9**	**10.3**
Urban	10.0	10.6	19.2	6.7	6.8	8.5
Rural	29.3	---	42.3	17.5	11.8	18.1
10 to 14 years of age	**8.3**	**5.9**	**20.2**	**2.0**	**1.7**	**2.8**
Urban	5.0	5.9	13.0	1.7	1.7	2.1
Rural	19.4	---	31.2	4.7	1.6	5.3

Source: Informações Estatísticas e Geocientíficas (IBGE), 1996

While the rates of return to schooling in Brazil have been falling since 1970, the returns remain higher than those for the United States (Tannen, 1991). Tannen believes that the lower rates of return to primary schooling may help to explain why few Brazilian male children complete the primary school cycle (through eighth grade). Poor, rural families are especially prone to the problem of high opportunity costs for children. Children (especially older children) are needed on the farm to perform productive activities or care for their younger siblings. This significantly

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impacts whether they complete the primary and secondary school cycles – especially if parents do not see high returns to the education their children receive (Schuh, 1997).

Imperfect capital markets also impact the completion rates of Brazilian students. When capital markets are imperfect, for example, families cannot borrow money to pay for children's educational expenses, children who would otherwise be in school may be forced into the work force as a survival strategy for the family (Levison, 1991). There is a positive correlation between school attendance and grade completion in Brazil (Levison, 1991). To advance to the next grade, students must pass an end of the year exam. Material is presented during class time and emphasis is placed on rote memorization. As a result, students must be present in class to learn the material.

For some children, long hours of work eventually force students and their families to make a choice between dropping out of school or leaving the labor force (Levison, 1991). While the number of hours children work in rural areas has declined in recent years, as Table 3 indicates, 49.6 percent of boys and 45.0 percent of girls in rural areas aged 5-9 work 10-20 hours a week and 40.2 percent of boys and 41.7 percent of girls aged 10-14 work 10-20 hours a week in the rural areas. A similar percentage of boys and girls work 20-40 hours a week (40.2 percent and 29.6 percent respectively). Approximately ninety-four percent of girls and 88.4 percent of boys in rural areas worked more than five hours a week in 1995. (Kassouf, 1995) given the hours that children in rural areas are working, it is easy to understand why they fall behind in their studies.

Table 3: Percentage of children Working (by numbers of hours worked per week)[2]

	Children aged 5 to 9 years		Children aged 10 to 14 years	
	Rural Boys	Rural Girls	Rural Boys	Rural Girls
Hours per Week				
1-5 hours	7.0	13.9	1.5	5.7
5-10 hours	23.7	30.5	7.0	14.5
10-20 hours	49.6	45.0	40.2	41.7
20-40 hours	17.0	9.4	40.2	29.6
40-100 hours	2.7	1.3	11.0	8.6
Average Hours	17.1	14.0	26.2	22.6

[2] Data taken from PNAD 1995 Database and presented in Kassouf (1999)

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The vocational education system has also failed to meet the needs of the poor and lower class populations. Traditional vocational education, once touted as the solution to improved individual earnings potential for certain sectors of the population, has not assisted in closing the income differentials among classes in Brazil – particularly in the rural areas. Interviews conducted with instructors in PROJOVEM[3] who attended the traditional vocational, agriculture technical schools indicated that while they learned a great deal about the scientific side of agricultural production, the programs did not teach them about how to manage an agribusiness, conduct market research to determine regional production needs, conduct cost-benefit analysis, or how to put together proposals to apply for bank loans. They believe that these aspects are critical to being a successful "farmer" in the future (Moore, 1999).

To promote continued rural development, the rural population needs a different type of education – one that continues to develop cognitive learning skills in the basic disciplines (math, Portuguese, history), but also provides the technical and managerial skills needed to form a new kind of professional. This professional should to be able to easily adapt new technologies, think critically, and successfully problem-solve without moving the student away from his or her reality. Schooling for the rural population, especially vocational schooling needs to have a broader focus. PROJOVEM proposes to fill this need.

III. Reconfiguring to meet the demands of economic liberalization.

In today's society there exists a consensus about the impact that education can have on the economic development of a country. In light of the enormous technical changes currently occurring world wide and increased competition among countries, education has become one of the most important contributing factors to reducing socio-economic differences among groups (Plank, 1996 and Manhani, 2000). In 1995, the W. K. Kellogg Foundation funded the University of Sao Paulo in partnership with the Paulo Souza Center for Educational Technology (CEETEPS) and the Sao Paulo state government to develop an education program that also addressed the relative absence of alternative employment options for young people in the rural communities. Based on the experiences of the *Casa Familiares Rurais* in southern Brazil and utilizing the pedagogy of *alternancia,* this partnership created the Rural Youth Farm Managers Training Program

[3] *Programa de Formacao de Jovens Empresarios Rurais* (PROJOVEM) is translated to mean "Rural Farm Entrepreneur Training Program". It is a non-formal alternative to public secondary education for rural adolescents created by the University of Sao Paulo in collaboration with the Paulo Souza Center for Educational Technology in 1995. It will be used as the case study for this dissertation.

(PROJOVEM). The objective of PROJOVEM is to prepare rural youth to administer and manage small farms competitively and sustainably, guaranteeing increased productivity for the farm and hence an increased standard of living for the rural family. While similar in pedagogy, PROJOVEM goes beyond the CFRs in that it focuses on providing students with managerial and business training.

PROJOVEM is a three-year program that functions on the premise of voluntary participation. The goal of the program is to provide students with the cognitive knowledge and technical skills to manage an agribusiness or small farm in a rural area. Each site receives students for one week of training a month in a group setting. The curriculum component is rooted in individual projects, not separate disciplines as the farm serves as a laboratory for learning. Needed materials are developed and utilized as projects are developed and the intended education is renewable and ongoing because the student is an active participant in the development of knowledge. The schools belong to the families so they play an active role in maintenance and decision-making. Monitors visit the students on their farms and take notes regarding what has been done with either homework assignments or projects. These notes are discussed in the next group meeting. Each year of the program emphasizes improved literacy skills, comprehension of texts, and the development of stronger numerical skills in addition to learning the specific disciplines required to carry out individual projects. The core pedagogy of PROJOVEM bases itself in the development of these individual projects, followed by administration and management of the property, and increased social activism to solve larger problems in the farming community. (Peres 1998)

There are four stages that the students progress through during the first two years in PROJOVEM.

Phase I: Diagnostic – Students are responsible for collecting data about the actual status of their own small farm. Data includes size of property, current equipment/farming equipment available, natural resources, regional data, and data on successful local farms[4] for the purposes of comparison. Students utilize a *Caderno da Empresa Agricola* (Agribusiness notebook) to note systemic observations while participating in family life. These observations are to increase the student's curiosity or interest in household activities and their relevance to the "culture" of family and farm life. Discussions stemming from these observations raise problems and suggest changes

[4] A successful farm is one that is more productive and efficient based on profits earned during the year.

to methods being followed for agricultural development. It is also the impetus for designing projects that assist in making farming more effective and profitable. This phase occurs in year one.

Phase II: Market Research – During this stage, students are responsible for researching the markets for various products that they are interested in producing to determine productive viability given the region the student lives in. They are also required to research the markets for intermediate products (if any) that will be required should they decide to produce a given product. This phase occurs in year one.

Phase III: Project Engineering – Students learn about the latest technology for farming differing products, benefit-cost analysis, and multi-attribute analysis as they begin to lay out the individual project that they are interested in implementing on the farm. This phase occurs in year two.

Phase IV: Analysis and Evaluation – Students conduct an evaluation and analysis of their project on paper to determine whether the project is an economically viable project, prior to implementation. This phase occurs in year two.

Students, with the assistance of the trainers, are responsible for developing business plans that encompass every aspect of agribusiness from strategic planning to obtaining loans, utilizing those loans to invest in the individual project, marketing their production, and eventually re-paying the loan. Repayment of the loan is placed into a "rotating fund" for future cohorts to utilize for their individual projects.

Within this process, students learn the disciplines necessary to carry out their projects, thus making their learning relevant. For example, if a student were interested in raising swine, he or she would learn principles from the fields of biology and chemistry to be able to correctly prepare feed for the animals. The student would utilize mathematics to be able to calculate the appropriate rations for individual swine, as well as how much to purchase for the entire group, ensuring that they received proper nutrition. When the swine are taken to market, the student learns business and marketing techniques and later how to reinvest into more swine or other capital on the farm to be able to repay his loans. (Peres 1998)

In the second year, the focus of the program shifts to helping students learn how to manage a farm or agribusiness in the growing global community that exists today. It also focuses on helping students understand how the various projects they have been designing and implementing interact with each other and with the global community. Finally, in the third year the focus of PROJOVEM shifts to the implementation of actual projects on the farm and learning activist principals with

special attention given to community cooperation and participation of the community in the development of entrepreneurial youth. Activism plays an even more important role because Brazilians, especially in rural areas, are traditionally taught to be reactionary rather than proactive. This mentality does not assist or inspire youth to develop personal steps towards development. PROJOVEM seeks to instill this ability to change and be a more active participant in agricultural development. (Peres 1998)

While still a relatively new program, PROJOVEM has already begun to show positive results. The program has successfully maintained and operated seven sites throughout the state of Sao Paulo and has new cohorts beginning in six of the seven sites. The site in *Promissao* has three cohorts and *Presidente Venceslau* began its fourth cohort in November 2001.

A new strategic partnership with the Souza Cruz Institute, which began in April of 2001 provided funding for the rotating fund (project implementation) and continued professional development for monitors in the program. As a result of this partnership, 26 student projects[5] related to the creation of greenhouses, dairy production and/or coffee production have been implemented and several other dairy related projects under evaluation for funding by a technical team. The program hopes to have 30 projects implemented by May 2002. The project implementation phase is important because it allows the student to reinforce the learned technical and cognitive skills, provides the foundation for improving the standard of living of the rural family (by providing additional income), and assists in developing the local credibility necessary for long-term sustainability of the program.

Preliminary analysis of data collected by Moore (2001) also reveals that the program is successfully transferring technology to these small family farms. Students have made changes on their properties such as building fences to allow for the rotation of pastures. This change preserves the land and allows the families to feed cattle throughout the year. Students have started conducting soil analysis prior to planting crops. The process of conducting soil analysis allows students to determine whether limestone needs to be added to the soil to reduce acidity prior planting. Improved seed and fertilizer varieties are increasingly being used, students are vaccinating their own animals, diagnosing and treating illnesses in the animals, implementing soil preservation techniques (such as curves to prevent runoff), and in a few cases students have artificially inseminated their own cattle with the assistance of monitors.

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[5] Of the 26 projects currently being implemented, 9 are in *Presidente Venceslau*, 9 are in *Promissao*, 7 are in *Rancharia* and 1 is in *Maracai*.

While it is still to early to measure increases in income directly related to participation in PROJOVEM, interviews conducted with parents and students indicate that families are experiencing slight increases in monthly income. Parents in *Presidente Venceslau* and *Promissao* indicated that one reason for the slight increase in their family income was due to the fact that they no longer had to hire agricultural technicians since their child had obtained the necessary skills and knowledge to carry out the work of a technician on the property. This saved the family money. Parents and students also indicated that information and skills gained from Projovem allowed them to raise better products (in most cases dairy production). The improved quality of the product allowed them to obtain a better price from either cooperatives or intermediary buyers.

Retaining young people in rural areas is critical to the development process because it retains important human capital in a sector that has traditionally lost its most valuable human capital to migration. If rural areas are to continue developing, increasing its comparative advantage and adjusting to the pressures created by the liberalization process, preventing valuable human capital from leaving agriculture becomes critical. Initial results indicate that Projovem is having some success retaining young people in the rural areas. Students in the first cohort of *Presidente Venceslau* (who have completed the three year program and are awaiting funding for their projects) have remained in the rural area. Nine students have already received funding to implement their projects and two additional students have relocated from the state of Sao Paulo to work as intern administrators on properties in the nearby state of *Mato Grosso do Sul*. Two more students acquired employment in the local area as a result of the knowledge they gained about agriculture and agribusiness management. While they are not working as farmers, they acquired the skills necessary to work at local institutions related to agricultural development at a higher wage than if they had not gained the knowledge and skills from Projovem.

IV. Hope for Rural Adolescents?

Latin America, and Brazil in particular, have vast areas of underutilized land and agricultural resources that could contribute to increasing food supplies and contribute to global economic welfare (Patrick 1977). Through agrarian reform, the state of Sao Paulo is attempting to move sectors of the population back into agriculture in an effort to further develop this comparative advantage, reduce the pressure on urban employment, and encourage rural development. However, if Brazil and its agricultural sector is indeed to become competitive and contribute to global economic welfare, there is a need to invest in more human capital and agricultural development.

Projovem is not a substitute for formal schooling. Formal schooling does play a critical role in teaching literacy and numeracy skills as well as providing the necessary credential for employment outside the agricultural sector. However, for students who choose to remain in agriculture, these programs can provide the critical components of a relevant education while reinforcing basic skills. Students in Projovem are forced to utilize mathematics skills in measurement and cost-benefit analysis. In fact, students in Projovem indicate that they are better students in the public schools because they now understand how principals of mathematics apply. In some cases, teachers have even requested the assistance of Projovem students in explaining geometry and algebra to their peers. Moreover, several Projovem students who had left the public education cycle, returned to complete their high school education.

As discussed throughout this paper, the pressures of economic liberalization have increased the need for more cognitive and practical skills to compete for employment. However, the education system – especially in rural areas – has lagged behind the changes brought on by increasingly open economies, increasing the relative income differentials between sectors of the population. While Projovem is not substitutes for public education, for rural adolescents, this programs serves as an important compliment that can help agricultural development by transferring technology and encourage rural development by giving students important new skills to develop the non-farm sector.

Through these programs students gain practical skills that are relevant to their realities (farming). The programs transfer new technology and knowledge to the families that allow them to make small changes in farming techniques, which lead to socio-economic improvements. Projovem takes one additional step by developing better managerial and administrative skills. Students learn the importance of planning, decision-making and thinking through an entire project prior to implementation. They learn to research prices so they have grounds to request better prices from cooperatives, intermediary buyers and firms. So while many small farms are being squeezed out by the forces of liberalization, the skills gained by students in Projovem help make their properties more efficient and hence, competitive.

A large sector of the rural population, particularly young people, are already involved in non-farm sector activities. This is one reason that agricultural areas suffer when populations migrate to urban areas; these non-farm sectors are abandoned; yet they provide a viable source of additional income. While the objective of Projovem is to better prepare rural adolescents to remain in the agricultural sector, the reality of the market is that the pressures of liberalization will cause

many small farms to shut down. This raises the question of whether Projovem provides transferable skills should participating students find themselves seeking employment in the off-farm sector. From the perspective of rural development and in the case of Projovem, the answer is yes.

The business training that students receive can help them start their own businesses (agriculture or non-agriculture related). With a good business plan, which students learn to develop in Projovem, they could facilitate rural development while remaining in the local region. New businesses would not only create employment for the students, but may create employment for others in town. Moreover, each Projovem site is equipped with computers. Students learn computer skills, work with Excel spreadsheets, and learn to research commodity prices using the internet. These are skills that can be utilized in the non-farm sector and are skills that the rural public schools generally do not provide.

The formal education system in Brazil has had a difficult time adjusting to the quickly changing demands brought on by economic liberalization. The relative distribution of income in Brazil has continued to deteriorate, exacerbating rural poverty and slowing the transfer of technology that contributes to agricultural development. The international community has increasingly given attention to the development of small farm holdings and to the modernization of the production processes in an effort to reduce these relative income differentials and help these populations gain the benefits of economic liberalization. Projovem is a local education program that sees both agricultural and rural development as important. While the program is still in its infancy, it has already shown positive results. If in the future this program can prove that it assists in developing transferable vocational skills, and assist in both agricultural and rural development then perhaps it could contribute to the institutional reform of rural schools in Brazil. This would in turn assist in increasing the rates of return to education in rural areas and help families achieve the benefits of economic liberalization.

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Appendix I:

Pedagogy of Alternancia

Appendix I: Pedagogia de Alternancia

Abade Granereau, a French monk who was the son of a rural farmer, developed *pedagogia de alternancia*. He was able to attend a monastery because his older brother assisted on the family farm. Based on his childhood and adolescent experiences, Abade Granereau united with parents in the rural area to develop a school that catered to helping rural youth improve their skills, assisting in human capital development. These schools have come to be known as *les Maisons Familiales Rurales* (MFR) or Rural Family Houses and instruction within these schools is known as alternative pedagogy as developed by Abade Granereau. Alternative Pedagogy is based on three main principals, which underlie development of the curriculum.

1. Technical Formation: Since the goal is to provide the student with skills that will assist in making the farm more productive, it is essential that the youth spend as much time as possible on the farm itself analyzing and critically thinking about production problems. Yet, the student also needs to understand the "why" of those problems to be able to resolve them. As a result, the MFRs attempted to balance work on the farm with a curriculum based in providing students with current technical knowledge and teachers assisted students in understanding the problems they faced on their farms.
2. General Formation – The goal of the MFRs was also to provide the students with increased general knowledge and skills to expand their access to other opportunities. As a result, students learned about the history of France, especially the agricultural history, geography, administrative and business principals, and the sciences that drove agricultural development. The important point to note is that the curriculum did not teach individual disciplines as traditional schools did, but rather it incorporated learning the knowledge as students developed projects and needed to learn the material.
3. Humanistic Formation – This principal focuses on developing a professional farm manager who was responsible and capable of providing leadership, direction, and social activism.

Critical to *pedagogia de alternancia* were constructivist methods of learning, hands-on projects (as described in the previous section) and parental involvement. Students would spend one week at the school working together with the trainers and three weeks on the farm carrying our various projects because alternative pedagogy believes that the student should not be removed from his environment and culture during his training. Implicit in this theory of learning is the idea that students conduct research, implement, reflect, and re-implement or make adjustments as they learn and it must be relevant to the reality in which they live. The student's family is always involved in this learning and the schools are specifically geared towards the children of rural farmers who were unable to finish the primary cycle of schooling for various reasons that have already been discussed. Both in the French context at the time this pedagogy was developed and today in Brazil, this applies to a large percentage of the population.

There are several other assumptions that underlie this particular theory of learning. First, creating these schools de-bureaucratizes education and keeps the state and federal governments from interfering in the education of this population, allowing educators to make the curriculum more relevant to their needs. Second, it assumes that no necessity exists for the formal education system to recognize the formal education system. Third, the program is terminal and assumes that there is no need to prepare the student to re-enter the formal education system, although, it does provide them with skills to do so if they choose. Finally, alternative pedagogy and the MFRs not only provide students with the skills to develop agribusinesses but also help them to socially integrate into the community.

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